DOCUMENT RESUME

ED 251 424 SP 025 432

AUTHOR Clark, Christopher M.
TITLE Research on Teaching and the Content of Teacher Education Programs: An Optimistic View. Occasional Paper No. 75.
INSTITUTION Michigan State Univ., East Lansing. Inst. for Research on Teaching.
SPONS AGENCY National Inst. of Education (ED), Washington, DC.
PUB DATE Jun 84
CONTRACT 400-81-0014
NOTE 21p.; Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 23-27, 1984).
AVAILABLE FROM Institute for Research on Teaching, College of Education, Michigan State University, 252 Erickson Hall, East Lansing, MI 48824 ($2.50).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Beginning Teachers; *Curriculum Development; Higher Education; Preservice Teacher Education; *Program Content; *Research Utilization; *Teacher Education Curriculum; *Teacher Education Programs; Teacher Educators

ABSTRACT

This paper presents a proposal for improving the relationship between the communities of research on teaching and teacher education. An examination is made on ways existing research on teaching might be used in curriculum planning for teacher education. Three changes are called for: (1) that researchers and teacher educators understand each other's work more profoundly; (2) that the curriculum planning process in teacher education be clearly delineated; and (3) that the concept of the newly graduated teacher be changed from that of "inexperienced expert" to "well-started novice." This concept, it is pointed out, would characterize beginning teachers as individuals who lack professional experience, but who are actively learning and continuing to develop toward expert status. It is argued that research on teaching could be made more useful in teacher education settings by conceptualizing the research outcomes as consisting not only of findings and implications, but also of concepts, theoretical models, questions, methods of inquiry, and case studies. It is predicted that appropriate use of research on teaching in the service of teacher preparation will not make teacher education easier, but will make it more appropriately complex. (Author/JD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

Occasional Paper No. 75

RESEARCH ON TEACHING AND THE CONTENT OF TEACHER EDUCATION PROGRAMS: AN OPTIMISTIC VIEW

Christopher M. Clark

Institute for Research on Teaching

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

C. M. Clark

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Occasional Paper No. 75

RESEARCH ON TEACHING AND THE CONTENT OF TEACHER EDUCATION PROGRAMS: AN OPTIMISTIC VIEW

Christopher M. Clark

Published By

The Institute for Research on Teaching
252 Erickson Hall
Michigan State University
East Lansing, Michigan 48824

June 1984

This work is sponsored in part by the Institute for Research on Teaching, College of Education, Michigan State University. The Institute for Research on Teaching is funded primarily by the Program for Teaching and Instruction of the National Institute of Education, United States Department of Education. The opinions expressed in this publication do not necessarily reflect the position, policy, or endorsement of the National Institute of Education. (Contract No. 400-81-0014)

Institute for Research on Teaching

The **Institute for Research on Teaching** was founded at Michigan State University in 1976 by the National Institute of Education. Following a nationwide competition in 1981, the NIE awarded a second contract to the IRT, extending work through 1984. Funding is also received from other agencies and foundations for individual research projects.

The IRT conducts major research projects aimed at improving classroom teaching, including studies of classroom management strategies, student socialization, the diagnosis and remediation of reading difficulties, and teacher education. IRT researchers are also examining the teaching of specific school subjects such as reading, writing, general mathematics, and science, and are seeking to understand how factors outside the classroom affect teacher decision making.

Researchers from such diverse disciplines as educational psychology, anthropology, sociology, and philosophy cooperate in conducting IRT research. They join forces with public school teachers, who work at the IRT as half-time collaborators in research, helping to design and plan studies, collect data, analyze and interpret results, and disseminate findings.

The IRT publishes research reports, occasional papers, conference proceedings, a newsletter for practitioners, and lists and catalogs of IRT publications. For more information, to receive a list or catalog, and/or to be placed on the IRT mailing list to receive the newsletter, please write to the IRT Editor, Institute for Research on Teaching, 252 Erickson Hall, Michigan State University, East Lansing, Michigan 48824-1034.

Co-Directors: Jere Brophy and Andrew C. Porter

Associate Directors: Judith E. Lanier and Richard S. Prawat

Editorial Staff
Editor: Janet Eaton
Assistant Editor: Patricia Nischan

Abstract

This paper presents a proposal for improving the relationship between the communities of research on teaching and teacher education. The author first calls for three changes: (1) that researchers and teacher educators begin to take one another's work more seriously, (2) that the curriculum planning process in teacher education be described, and (3) that the conception of the newly graduated teacher be changed from that of "inexperienced expert" to "well-started novice." The author then argues that research on teaching could be made more useful in teacher education settings by conceptualizing the outcomes of this research as consisting of not only findings and implications, but concepts, theoretical models, questions, methods of inquiry, and case studies. The paper concludes with the prediction that appropriate use of research on teaching in the service of teacher preparation will not make teacher education easier; it will make it more appropriately complex.

RESEARCH ON TEACHING AND THE CONTENT OF TEACHER EDUCATION PROGRAMS: AN OPTIMISTIC VIEW[1]

Christopher M. Clark[2]

The ideas expressed here evolved from reflection on my work as a researcher on teaching and as a teacher educator. My optimism about the fruitfulness of connections between these two domains of practice comes from personal experience in making these very kinds of connections in my own work. The connections between research and teacher education are still far from perfect, but I believe that both fields have reached a watershed period in which the interests of both will be served by taking a creative look at how research can serve teacher education.

A number of researchers have purported to show that research on teaching has not been, cannot be, and should not be applied to the practice of teaching or that special branch of teaching that is teacher education. For example, Heath and Neilson's review (1974) of research on teaching led them to conclude that this work was, because of various methodological and conceptual flaws, a completely unsound basis for recommendations to practice. Phillips (1980) provides a list of logical and philosophical pitfalls and errors that erode what little confidence may remain in deriving implications for practice from educational research. And Eisner (1984) castigates researchers for prescribing that practitioners ground their teaching in research when they themselves (as university faculty) seldom, if ever, seem to take their own

---

[1]Paper presented at the annual meeting of the American Educational Research Association, New Orleans, Louisiana, April 24, 1984.

[2]Christopher M. Clark is co-coordinator of the IRT's Written Literacy Forum and a professor in MSU's Department of Counseling, Educational Psychology, and Special Education.

medicine. (But see Baker (1984) for a cogent argument against Eisner's logic on this point.) Needless to say, my optimism does not arise directly from analyses such as these, although I believe they are constructively provocative pieces of work.

Nor does my optimism come directly from the writings of scholars such as N.L. Gage who, in his 1972 book, *Teacher Effectiveness and Teacher Education*, argues that the major mission of research on teaching is to discover "'successful' teacher behaviors" (p. 28) that can then be taught directly to prospective teachers. This logic, further elaborated in Gage's more recent book, *The Scientific Basis of the Art of Teaching* (1978), leads to and supports various forms of competency-based teacher training. But this is not what I advocate here.

No, what I offer is a taxonomy describing the variety of ways in which existing research on teaching might be used in curriculum planning for teacher education. My major thesis is that both proponents and opponents of using research on teaching in the practice of teacher education have taken unprofitably narrow views of what research has to offer and how what it has to offer might be used. My hope is that, by broadening their conceptions of what research has to offer to teacher education, researchers can escape from the dilemma that Wagner (1983) refers to as a "cognitive knot"--a situation in which one says alternately, "Teacher education *must* be based on research!" and "Teacher education *is not* based on research."

Conditions for Mutual Exchange

Before I get to my list of ways in which research on teaching can serve teacher education, I want to discuss three conditions that I believe are necessary for mutually profitable relations between the communities of research and teacher education.

Take Each Other Seriously

First, I believe that members of each community must take seriously their own work and that of the other community. Taking one's own work seriously is not usually a problem (although most researchers have encountered colleagues who have retreated into cynicism). But it is not uncommon for researchers to view the work of teacher education as intellectually simple, relatively less demanding, and technically, rather than conceptually, oriented. Some teacher educators, for their part, view researchers as isolated and impractical people who pursue their own parochial interests with little or no sensitivity to the questions and needs of practice. Attitudes like these are all but certain to preclude mutually profitable communication.

One antidote to this problem, I believe, is for more of those who identify themselves as researchers to also become teacher educators and more of those who are primarily teacher educators to also become researchers. During the past two academic years, I have become more of a teacher educator through supervising doctoral dissertations in teacher education; co-teaching a new course to prospective teachers; working with a faculty group engaged in planning, operating, and improving a new teacher education program; and by collaborating in an exploratory study of knowledge, decision making, and action among supervisors of a student teaching practicum. I must confess that none of these experiences arose from my own initiatives--I was drawn into them with varying degrees of reluctance. But my efforts to do well as a teacher educator, as a novice, and as an insider have raised my appreciation of the intellectual demands, the complexity, and the rewards of this kind of work. I suspect that a similarly positive set of changes would take place for teacher educators who work to become insiders in the research community.

Apprehend Curriculum Planning

A second initiative that could encourage rapproachment between research on teaching and teacher education is to describe and better understand the curriculum planning process in teacher education. Although I believe that there is no well-documented description of curriculum planning in teacher education, some of what has been learned from the study of teacher planning (Clark, 1983) and of the diffusion of educational innovations might be relevant here. At the very least, these bodies of descriptive research suggest to me that (a) the process of curriculum planning in teacher education is probably different from that prescribed by curriculum theorists; (b) many "non-research considerations" enter into this planning process (e.g., the university calendar, budgets, available personnel, tradition, politicization of credential regulations, field-site demands for practice teaching); (c) comprehensive planning and review of the entire teacher preparation process is rarely undertaken; and (d) ideas for changes in the curriculum that originate outside the system are rarely integrated into the teacher education curriculum. Even if only one of these four hypotheses proved true, it would be worth the cost of finding out, because investigation would reveal that present thinking about research and practice is at least partially grounded in misconceptions.

Reexamine What a Teacher Education Graduate Is

Third, teacher educators need to reexamine their conception of the fully prepared graduate of teacher education programs. Who is this (usually) young person who has more or less successfully jumped through the hoops of an undergraduate teacher education program? Unfortunately, I believe those who have instructed the new graduates have set them (and their employers) up to believe that they are "inexperienced experts" at the art and science of

teaching. That is, they are people who have most of the technical skills and disciplinary knowledge of master teachers, but who lack only a year or so of whatever it is that experience teaches. In their hearts, of course, graduates recognize this as a set-up, another of Wagner's cognitive knots: "I must be an expert"; "But I don't feel like an expert." And the typical resolution of this distress is for graduates who do get teaching jobs to declare that much or all of their teacher education was irrelevant, useless, or misleading--throwing out the good with the bad.

I propose a more constructive view of the new graduate of a teacher preparation program--that of "well-started novice." A novice lacks professional experience, has a general orientation to the profession, some as yet unpracticed pedagogical skills, and some academic knowledge of one or more fields. Most importantly, the acknowledged role of the novice is to learn, to actively continue in his/her development toward expert status. John Dewey (1904) proposed essentially this vision of the newly graduated teacher 80 years ago. Just imagine how this change in vision could take the pressure off teacher educators, their students, cooperating teachers in the practicum experience, and the teachers and administrators who work with graduates. The focus for all concerned could shift from evaluation in relation to an unattainable criterion (instant expert) to support for integrating university experiences with practical experiences and for learning how to learn from experience.

To summarize, I believe that improved conditions for making use of research on teaching in teacher education would result from (a) teacher educators and researchers coming to know and take seriously one another's professional domains, (b) a better understanding of the curriculum planning process in teacher education, and (c) a revised vision of the teacher education graduate as a well-started novice. There are a number of ways in which existing research on teaching might be useful in such a world.

Enriching Teacher Education Curricula

Briefly, my proposition is that research on teaching has six different but related classes of outcomes that can be used to enrich teacher education curricula:

1. observed relationships among variables,
2. concepts,
3. theoretical models,
4. questions,
5. methods of inquiry, and
6. case studies.

My hope is that by thinking more broadly and divergently about what research on teaching has to offer (e.g., the six classes of outcomes), researchers might improve both the research on teaching enterprise and the practice of teacher education. At the very least, both sets of parties may come to believe that the grounds on which they could meet are larger and have a more varied and interesting terrain than is typically thought.

Observed Relationships Among Variables

Classically, the fruits of the research process are expressed as "findings and implications." The "findings" part of this dyad consists of brief summary descriptions of the observed relationships among variables studied, while the "implications" are inferences drawn by the researchers that typically go beyond the data. To oversimplify, findings are observed facts about the world, and implications are what the investigator believes these facts suggest about how practitioners should behave in situations similar to the experimental one. The facts that many researchers on teaching pursue consist of causal statements about the relationship between particular teacher behaviors and measured student achievement. Researchers have pursued still other

kinds of facts about teacher thinking and have sought to describe how teachers plan, process information, and make decisions (see Clark & Peterson, 1984). Both kinds of research have helped establish research on teaching as a distinct and even thriving field, but the direct translation of findings and implications into prescriptions for the teacher education curriculum has not worked well for all of the reasons articulated by Cronbach (1975), Eisner (1984), Fenstermacher (1979), Floden and Feiman (1981), and Phillips (1980). In my judgment, those findings that describe observed relationships among teachers' and students' visible or cognitive behaviors are the least likely to be directly useful in decision making about the content of teacher education programs. The specific findings of research on teaching relate to a narrow and decontextualized slice of what teachers *do*, rather than to what it is like to *be* a teacher. Undergraduates are preparing themselves to *be* teachers, to be accepted members of the professional community of educators. "Skill without an overriding vision can be self-limiting" (Baumbach, 1983).

However, I do have a suggestion that might yield additional mileage from reexamination of this research. I have long believed that ineffective teaching--poor teaching, if you will--is due less to the absence of particular effective strategies and teacher behaviors than it is a consequence of the presence of things that teachers sometimes do that sabotage what could otherwise be good teaching. When, for example, students are faced with double binds and mixed messages about competition and cooperation, meritocracy and egalitarianism, equality of opportunity and (self-fulfilling) prophecies about the normal distribution of achievement, even technically excellent teaching may have mediocre effects. I propose to rephrase the big question of researchers on teaching effectiveness from, "What kind of teaching (or teacher thinking) works best in almost all situations?" (a discouraging question to

pursue) to "What have some teachers done sometimes that have fouled things up?" Taking this perspective, could a reexamination of the literature of research on teaching yield ideas about what are some of these avoidable impediments to good teaching and school learning? And would it not make sense to include attention to these empirically observed impediments and pitfalls in teacher preparation programs? (Remember that the Ten Commandments have stood up for so long, in part, because they constitute a short list largely about what people should *not* do, rather than a detailed prescription for what people should do. Perhaps proscriptions are more generalizable than prescriptions.)

The researchers who did the original work may have to be the ones who lead the search for evidence of impediments to good teaching, because explicit attention is seldom given to this side of teaching effectiveness when a study is first reported. Such evidence is more often present in the parts of the story that are left out of journal articles and technical reports or in sometimes speculative explanations of surprising or seemingly paradoxical findings. To illustrate from my own work, I was part of a team that did a laboratory study of teacher planning and teaching effectiveness in 1974 (Peterson, Marx, & Clark, 1978). One surprising finding was that, among 12 teachers who thought aloud while planning, a significant negative correlation existed between the raw number of planning statements they made and their students' post-teaching achievement-test scores. Paradoxically, more planning was associated with lower achievement, and that is where we left matters in 1978. Now, with several years of hindsight, I believe a more satisfying and logical explanation exists for this anomaly: The teachers with the largest numbers of planning statements were those who focused their attention almost exclusively on reading and reviewing the content to be taught, devoting little or no planning time to the process of instruction. These teachers (legitimately) used

their planning time as a study and curriculum review session and emerged with increased knowledge of their subject matter, but without a well-thought-out plan for instruction. This leads me to make a practical suggestion: that teachers and prospective teachers should pay attention to how they spend their planning time and to the balance between attention to subject matter and attention to the instructional process. Novices, especially, should be cautioned that planning for teaching is different from studying for a test (even though there is sometimes a test-like quality to observed sessions of practice teaching).

Concepts

A second category of outcomes of research on teaching is that of concepts, verbal labels for phenomena that researchers have found useful in describing the dynamics of the classroom, aspects of teaching and school learning, and the curriculum. From the researcher's point of view, concepts about teaching are seen as a means to the end of defining variables and subsequently measuring strength and direction of relationship among those variables. But I think that concepts themselves, when they are usefully descriptive of teaching, can be valuable products of research on teaching and potentially useful in planning the content of teacher education programs. Examples of concepts of this kind include academic learning time (Fisher, Berliner, Filby, Marliave, Cahen, & Dishaw, 1980), academic work (Doyle, 1983), wait time (Rowe, 1974), the steering group (Lundgren, 1972), withitness (Kounin, 1970), incremental planning (Clark & Yinger, 1979), and the occasion for writing (Clark & Florio, 1982). Many more concepts of this kind that originated in research on teaching are not obvious to the naive observer of the practice of teaching. These concepts should be a part of the conceptual vocabulary of novice teachers. Concepts help people organize, make sense of,

communicate about, and reflect on their experiences. A teacher education program that equips its graduates with some of the means to do these things is on the right track.

Theoretical Models

A third outcome that could be applied to teacher education is the theoretical model. By this I mean verbal or graphic representations of the relationships among concepts in teaching-learning situations. Theoretical models can serve all of the functions that I attributed to concepts above, and they also provide a more comprehensive framework for thinking about and perceiving classrooms in their complexity. Examp'es of theoretical models and constructs that could serve these purposes include the Carroll Model of School Learning (Carroll, 1963), Shavelson and Stern's (1981) and Peterson and Clark's (1978) models of teacher interactive decision making, Yinger's (1977) process model of teacher planning, and the participation structure of the classroom (Philips, 1972; Shultz, Florio, & Erickson, 1982). It is important, I believe, that abstractions of the kind that these models represent be taken as heuristic and suggestive rather than as prescriptions for "the correct way to think about teaching." Indeed, their principal value in teacher education may be that exposure to multiple theoretical models could encourage novice teachers to examine, make explicit, and refine their own implicit theories.

Questions

The fourth outcome of research on teaching on my list is questions. Here I commend to you both questions that are posed at the outset of a study and used to guide inquiry (typically called "research questions") and questions that are raised later, both when researchers are trying to make sense of the data and when they are calling for additional research. A novice can learn a

great deal about what is problematic in teaching by learning what challenging and partially answered questions thoughtful researchers ask. Even (or perhaps especially) when questions seem to have no definitive answers, they can serve to orient professional reflection. Similarly, researchers could learn a great deal from taking the concerns and dilemmas of practicing teachers into account as they frame the questions that guide their research. Examples of generative questions being addressed by researchers on teaching include: Why is writing so difficult to teach? What are the possibilities and limitations of small-group cooperative learning? What makes some schools more effective than others? What roles do textbooks play in school learning? How can individual differences in student aptitudes for learning be accommodated? What roles do teacher planning, judgment, and decision making play in classroom instruction? How do teachers' implicit theories affect their perceptions and behavior?

Methods of Inquiry

Fifth, research on teaching can be a source of methods of inquiry by inventing, demonstrating, and discovering the limitations of various techniques and tools for describing and understanding teaching. Teacher educators and their students need ways of seeing, describing, and analyzing the complexities of teaching that go beyond what one can do with unstructured, on-the-spot observations. Researchers have developed many category systems for counting and rating the quality of teacher-student interaction (Simon & Boyer, 1970), including some that focus on dyadic interactions between the teacher and particular students (e.g., Brophy & Good, 1974). The technology of microteaching was originally developed to meet the needs of researchers on teaching and has been adopted as a useful part of many teacher preparation programs. More recently, researchers studying teachers' thought processes have employed stimulated recall, think-aloud procedures, and structured journal writing to

make visible the formerly hidden world of teaching. And practitioners of the ethnography of classrooms have provided clear examples of what their methodology can accomplish as well as improved guidelines for how to pursue this kind of inquiry and what some of its limitations are. All of these methods of inquiry offer interesting possibilities for adaptation in teacher preparation programs if an important goal of teacher education is to equip graduates to be reflective, analytic, and constructively critical of their own teaching.

Case Studies

Sixth, and finally, research on teaching has recently been producing case studies--rich and thick descriptions of classroom events--ranging in duration from a few moments to an entire school year. Case studies can serve a number of valuable purposes in teacher education programs, including illustration of concepts and theoretical models in context, providing opportunities for teacher educators and their students to analyze and reflect on real classroom events from a variety of disciplinary points of view, and illustrating how the perspective held by the researcher shapes and limits the form and content of the resulting case study. At Michigan State University I and my colleagues Robert Floden and Susan Florio-Ruane have been using case studies from research on teaching to serve these purposes in our undergraduate teacher education courses in educational psychology, the philosophy of education, and language arts methods.

In conclusion, I believe that research on teaching has a great deal to offer to teacher education if one thinks more broadly than most people are accustomed to about what research actually produces. Observed relationships among operationally defined variables in a particular study may be the primary product of research for the audience of other researchers. But prospective teachers can and should be helped to become reflective and autonomous

professionals by having faculty share with them the concepts, models, questions, methods of inquiry, and case studies that research on teaching also produces. And just as the novice teacher, so prepared, must still face a complex and demanding problem-solving situation in his/her own classroom, teacher educators must also continue to wrestle with what, how, when, and whether to use the products of research on teaching in their curricula. Research on teaching probably will not make the process of teacher preparation simpler, but it can be used in ways that make teacher education more appropriately complex. For me, this constitutes progress.

References

Baker, E.L. (1984, March). Can educational research inform educational practice? Yes! Phi Delta Kappan, 65, 453-455.

Baumbach, J. (1983). Writing teaching. In N.L. Shapiro & R. Padgett (Eds.), The point: Where teaching and writing intersect. New York: Teachers and Writers Collaborative, 10-13.

Brophy, J.E., & Good, T.L. (1974). Teacher-student relationships: Causes and consequences. New York: Holt, Rinehart, & Winston.

Carroll, J.B. (1963). A model of school learning. Teachers College Record, 64, 723-733.

Clark, C.M. (1983). Research on teacher planning: An inventory of the knowledge base. In D.C. Smith (Ed.), Essential knowledge for beginning educators. Washington, DC: American Association of Colleges for Teacher Education, 5-15.

Clark, C.M., & Yinger, R.J. (1979). Three studies of teacher planning (Research Series No. 55). East Lansing, MI: Institute for Research on Teaching, Michigan State University.

Clark, C.M., & Florio, S., with Elmore, J.L., Martin, J., Maxwell, R.J., & Metheny, W. (1982). Understanding writing in school: A descriptive case study of writing and its instruction in two classrooms (Research Series No. 104). East Lansing, MI: Institute for Research on Teaching, Michigan State University.

Clark, C.M., & Peterson, P.L. (1984). Teachers' thought processes (Occasional Paper No. 72). East Lansing, MI: Institute for Research on Teaching, Michigan State University.

Cronbach, L.J. (1975). Beyond the two disciplines of scientific psychology. American Psychologist, 30, 116-126.

Dewey, J. (1904). The relation of theory to practice in education. National Society for the Scientific Study of Education. The relation of theory to practice in the education of teachers (3rd yearbook, Part I). Bloomington, IL: Public School Publishing Co., 9-30. Reprinted in R. Borrowman (Ed.)(1965), Teacher education in America. New York: Teachers College Press.

Doyle, W. (1983). Academic work. Review of Educational Research, 53, 159-199.

Eisner, E.W. (1984, March). Can educational research inform educational practice? Phi Delta Kappan, 65, 447-452.

Fenstermacher, G.D. (1979). A philosophical consideration of recent research on teacher effectiveness. In L.S. Shulman (Ed.), Review of research in education, 6. Itasca, IL: F.E. Peacock, 157-185.

Fisher, C.W., Berliner, D.C., Filby, N.N., Marliave, R., Cahen, L.S., & Dishaw, M.M. (1980). Teaching behaviors, academic learning time, and student achievement: An overview. In C. Denham & A. Lieberman (Eds.), Time to learn. Washington, DC: National Institute of Education, 7-32.

Floden, R.E., & Feiman, S. (1981). Should teachers be taught to be rational? Journal of Education for Teaching, 7, 274-283.

Gage, N.L. (1972). Teacher effectiveness and teacher education: The search for a scientific basis. Palo Alto, CA: Pacific Books.

Gage, N.L. (1978). The scientific basis of the art of teaching. New York: Teachers College Press.

Heath, R.W., & Nielson, M.A. (1974). The research basis for performance-based teacher education. Review of Educational Research, 44, 463-484.

Kounin, J. (1970). Discipline and group management in classrooms. New York: Holt, Rinehart, & Winston.

Lundgren, U.P. (1972). Frame factors and the teaching process. Stockholm: Almqvist & Wiksell.

Peterson, P.L., & Clark, C.M. (1978). Teachers' reports of their cognitive processes during teaching. American Educational Research Journal, 15, 555-565.

Peterson, P.L., Marx, R.W., & Clark, C.M. (1978). Teacher planning, teacher behavior, and student achievement. American Educational Research Journal, 15, 417-432.

Philips, S.U. (1972). Participation structures and communicative competence: Warm Springs children in community and classroom. In C.B. Cazden, V. John, & D. Hymes (Eds.), Functions of language in the classroom. New York: Teachers College Press.

Phillips, D.C. (1980). What do the researcher and the practitioner have to offer each other? Educational Researcher, 9, 17-24.

Rowe, M.B. (1974). Wait time and rewards as instructional variables, their influence on language, logic, and fate control: Part one--wait time. Journal of Research in Science Teaching, 11, 81-94.

Shavelson, R.J., & Stern, P. (1981). Research on teachers' pedagogical thoughts, judgments, decisions, and behavior. Review of Educational Research, 51, 455-498.

Shultz, J., Florio, S., & Erickson, F. (1982). Where's the floor? Aspects of the cultural organization of social relationships in communication at home and at school. In P. Gilmore & A. Glatthorn (Eds.), Children in and out of school: Ethnography and education. Washington, DC: Center for Applied Linguistics.

Simon, A., & Boyer, E.G. (Eds.). (1970). Mirrors for behavior II: An anthology of observational instruments. Classroom Interaction Newsletter, special edition.

Wagner, A.C. (1983). Conflicts in consciousness: Imperative cognitions can lead to knots in thinking. Paper precented at the First Symposium of the International Study Association on Teacher Thinking. Tilburg University, the Netherlands.

Yinger, R.J. (1977). A study of teacher planning: Description and theory development using ethnographic and information processing methods. Unpublished doctoral dissertation, Michigan State University.